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Classic Computing

The Enthusiast's Magazine of Computer History Nostalgia

Issue #1

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But What's Out . . .
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Classic Computing
(formally
Historically Brewed)

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From the Publisher

After all these years . . .

By David Greelish

Wow! I finally did it - I finished *Classic Computing* magazine, issue 1! Welcome to the first, and last issue of the magazine of computer history nostalgia (that almost never was). It's missing the letters section, ads, Trading Post, "Friends," as well as a few other things, but I think it still has the soul of what *Historically Brewed* was. This essentially would have been *HB* issue 10. I had decided a name change was in order so that anyone could immediately know what the magazine was about. The covers were printed around 1998 and cost $500! They were my first full-color ones. That pretty much "broke the bank" and stopped my magazine publishing days permanently (I'm keeping this short, so read the full story in my book). I have had the covers boxed up for 14 years until now. The articles here were all submitted to me around that time too ('97 - '98) and my wife and I did a preliminary layout in my QuarkXpress software for the Macintosh.

* Unfortunately, bylines had not been assigned yet for two articles, so now years later, I no longer have their original files, or authors. They were in the issue and stay in the issue. It would be cool if I hear from one of them in the future. They might just get a kick out of knowing that their writing finally got published!

I hope you enjoy the stories. Having now re-read them all again during layout and editing, I have to say that they are all very good! Drop me a line please, let me know what you think. I will publish them on my blog.

David Greelish, Computer Historian
President, Atlanta Historical Computing Society

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Collecting Classic Computers

The Hobby Goes Mainstream

By Kevin Stumpf

Much has happened, much is happening, and there is still much, much more to happen. This article is a quick introduction for the would-be collector and a status report for the established collector.

These are exciting times for established and would-be computer collectors. Fears have been proven unnecessary, that all of the good, big or little, old computers have long since been destroyed. Claims have also been proven incorrect that the skills and knowledge to repair and restore old computers have been lost. There is still plenty of everything for everyone.

The computer field is already over fifty years old now, but in the grand scheme of things, that is quite young, too young for many "end ofs" to creep into its vocabulary. This is just the beginning. If you started collecting today, you can easily build a collection and enjoy the hobby just as much as someone who started ten years ago.

Even the gender breakdown is shifting. When, in 1984, I started collecting computers, any collectors I knew or knew of, were also males. By 1998, when I wrote and published *A Guide to Collecting Computers and Computer Collectibles: History, Practice, and Technique*, I had met two women who admitted to collecting computers. Today, I know three female computer collectors.

Much has happened, much is happening, and there is still much, much more to happen. This article is a quick introduction for the would-be collector and a status report for the established collector.

Brief History of the Hobby

Collecting computers became popular with the advent of microcomputers (desktops, laptops, etc.), and that makes sense. Microcomputers are physically small and relatively inexpensive, making them easy to collect. This also made them appealing to would-be collectors, but these aren't the only qualities that explain the sudden surge in the number of computer collectors.

Microcomputers brought computing to the people, and many people found they liked it. The pleasure of personal computing increased computer literacy and the number of would-be collectors. Just like the IBM PC was the boost the industry needed, so microcomputing in general was the boost the hobby of collecting computers needed.

The first known collector started his collection in 1966 with a 120,000kg (about 24,000lb) behemoth. That collector was Claude Kagan, and he worked at Bell Labs in New Jersey. When his employer decided to replace their Burroughs 205, Claude acquired it and had it installed in a barn (remember, computers needed lots of space back then and generated lots of heat, so a barn was an ideal place to keep it). Many people around the world must have been accumulating mementos of the computer revolution, but nothing like Claude's effort stands out again until a year later in 1967. When then, Gwen and Gordon Bell officially announced The Computer Museum in Boston, Massachusetts.

Private collections started in earnest, but it wasn't until 1993 that it was recognized as a hobby when David Greelish published the first issue of a newsletter he called *Historically Brewed*

under an organization called the Historical Computer Society. That same year, Dr. Thomas Haddock published a price and rarity guide called *A Collector's Guide to Personal Computers and Pocket Calculators*. Both publications were ahead of their time, but they helped galvanize the hobby - some people became computer collectors.

In 1996, Bill Whitson opened a list server on the Internet called the Classic Computers List. It is still serving a very active community of collectors from around the world. Following that, in the autumn of 1997, Sellam Ismail held the first gathering for computer collectors, the Vintage Computer Festival 1.0. That was followed this year with VCF 2.0, and next year the VCF 3.0 will again be held in the fall - October 2nd & 3rd at the Santa Clara Convention Center in Santa Clara, California.

This year saw a significant increase in the public buying and selling of old computers and computer paraphernalia on an on-line auction web site called eBay (www.ebay.com). During the summer, the first ever book about collecting computers was published and a number of articles were printed about the hobby in magazines and newspapers.

Today, there are over 100 collections detailed on personal web sites and about 1,000 collectors worldwide, actively collecting and thoroughly enjoying playing with (er, I mean using), talking about, acquiring, cleaning, and just looking at old computers.

What Is A Collector?

There is an important distinction to be made between computer enthusiasts and computer collectors. We all probably know at least one person who somehow came to own an interesting piece of computing history. This doesn't automatically qualify that person as a collector, but as an enthusiast. It is like you or I came across an authentic, handwritten letter from someone who has made a significant contribution to humanity. Even if we do not have another thing connected with that person, nor had we known much about that person before this discovery, we would probably still keep the letter. We might even mount it and show it proudly to everyone who enters our home. We would own something that everyone can appreciate as special. Collectors, on the other hand, deliberately seek to build a collection (note: size is irrelevant) and seek to enjoy their collection. For instance, the man in Toronto, Ontario who has the almost pool-table-sized control panel from an IBM 360/75 (1968) hanging on a wall in his rec room is an enthusiast. My ten tons of hardware, software, supplies, documentation, control panels, etc. qualify me as a collector.

Terminology

Collecting computers isn't a venerable hobby, yet. Books, coins, stamps, music boxes, etc. have been collected for hundreds of years. This means we can learn a thing or two that will help us enjoy our hobby. Something every collector should learn is the lingo of collecting. Here are a few important terms.

Antique - The generally accepted definition is something over 100 years old. According to this definition, there are no antique computers. This point can be argued though, if you claim the rate of change computers experience to be substantially higher than changes in humans, computers can be judged to age like dogs do. It is much easier to accept the general definition and stop using the term until sometime around 2040, when the Colossus, ENIAC, Zuse III, and others, will celebrate 100-year anniversaries.

Artifact - A human made object. In a historical context, it usually refers to items in a museum collection.

Classic - Something that was the first of its kind or set a standard by which all other similar things are measured against.

Collectible - Something originally made to be used, not collected, but that eventually stopped being used and was collected.

Ephemera - Something that is useful for a very short time. In collecting circles, ephemera commonly means paper.

Memorabilia - Things worthy of remembrance.

Memento - Anything that reminds you of the past.

Paraphernalia - Apparatus, fur-

nishings and ornaments that are somehow associated with each other. The word reminds me of the mainframe days when the word peripheral was popular. It was used to describe all the equipment surrounding the CPU. Tape drives, printers, card readers, etc. were called peripherals.

Premium - A bonus offered as an inducement to purchase, or a reward given for a particular action.

Provenance - A record of ownership and origin. As our hobby matures, this will become very, very important.

Relic - Something considered the last of its kind. It's what's left after other things like it have been lost, or through decay, are no longer functional or restorable.

Vintage - Something that was well known in the past.

Plus, we must agree to use terms that are old, but serve the purpose well. I am referring to the terms mainframe, minicomputer and microcomputer.

Mainframes - Not only are mainframes big, but you must understand that at one point in time, the only type of computer was the mainframe. Mainframes are either old or if they are from 1965 to the present, are physically very large. There are certain architectural qualities that can also be used to distinguish mainframes from high-end minicomputers, but that discussion isn't relevant here. What also makes the distinction difficult to discern is that mainframe families came in a variety of models and sizes.

Minicomputers - Often are single user, but it is the physical size that separates these machines from others.

Microcomputers - Yes, size here is very important - all microcomputers are small. This should make the categorization easy to discern, but an even easier method is determining if the computer runs on a single microprocessor (an Intel Pentium for instance). If it does, it is a microcomputer and within this category are desktops, workstations, laptops, etc.

Sources

There is still time to find that special something you want in your collection. Years ago, I predicted that the remaining source of big, old computers would be garages, rec rooms and corporate catacombs. I was right. Eventually, enthusiasts must part with their mementos. This explains why still wonderful and interesting things are being found in garages and rec rooms.

My own example of this centers around a unique minicomputer that was shipped to me from a garage on Long Island. Recently, a man called and told me he was moving and needed to dispose of the Data General and Keronix minicomputers he had in his garage. The name Keronix was music to my ears and I'll gladly tell you why, because collectors love to tell (and re-tell) their acquisition stories.

The first successful minicomputer manufacturer was the Digital Equipment Corporation (DEC) of Massachusetts. From DEC, a competitor was born in the form of Data General (DG). A small company called Keronix built peripherals (memory, disk drives, etc.) for DG computers and eventually decided to build a clone of DG's famous Nova line. That didn't sit well with certain employees of DG, so they burnt the Keronix plant to the ground. Interesting story eh? Still, through all of this, Keronix did build and market the DG clone, one of which ended up in my "warehouse" via Long Island.

Another plentiful source is what I call corporate catacombs. You are likely to find forgotten treasures in storage rooms and in the far corners of warehouses. Over the years, companies (and government organizations) acquired computers by either renting them, leasing them, or buying them. The ones that were purchased were often difficult to let go. They cost too much to simply send to the dump, so they would be moved to an out of the way place until more economical disposal arrangements could be made. Out of sight, they usually ended up abandoned and sitting for years waiting for someone like you to rescue and care for them.

Something a good computer collector should never do is pass by a Goodwill type store. The most remarkable items are donated to these relief organizations. Not just computers, but books, software, hard-to-find cables, and supplies (ribbons, diskettes, etc.). Buying from these organizations demonstrates

the win-win economic model.

History of Computing

The Keronix story highlights a real concern. More than being a concern about the hobby of collecting computers, it is about the way information on the web is interpreted. Beware of legends and hearsay posing as history. People contribute their recollections of a company, product, technology, etc. and then once published, these memoirs become history to those who read them. Due to the nature of electronic public networks, this information is distributed to many others and if it is misinformation, too bad, the damage is done.

If you intend to write about your collection, you must still do your research. When reading postings to newsgroups and lists, or someone's web site, you must do so with a very critical eye. Don't pollute the infosphere, contribute information in a responsible manner.

Collecting Options

Microcomputers are fun. Microcomputers are quiet. Microcomputers are easy to carry, but don't shy away from collecting (and therefore preserving) minicomputers, and yes, dare I say, mainframes. Nothing worthwhile is easy to obtain, so just think of all the fun you'll have sourcing, moving, and finally playing with your fridge or room-sized, big, old computer.

Perhaps you've started with microcomputers deliberately, just to get your feet wet. Then again, perhaps you've convinced yourself that anything bigger than a 286 is out of your range; someday, that big computer bug just might bite you. When and if it does, don't panic, the antidote isn't buying two Altairs and calling your doctor in the morning. Examine your present circumstances and who knows, that classic mainframe just might fit into your life and your garage. But, enough of that. Enough of focusing exclusively on hardware and software. The computer industry has always been big, flamboyant, and diverse, giving collectors many choices. Don't feel obligated to collect actual computers. You can collect books, documentation, magazines, stocks from defunct companies, clothing, mugs, pens, mouse pads, and the list goes on and on. The trick about collecting is to know when to say no. You can't collect everything. You should first decide what your focus will be. It might be one of every computer you have ever worked on. It might be every computer that was based on the Motorola 6800 and 68000 microprocessors. This method gives your collection a theme - something you can use to gauge your effort and increase your enjoyment.

Next, admit that you must concentrate on the theme. If you collect UNIVAC mainframes, don't worry if you can't buy a mint condition plastic "Think Again" sign for $50. If you collect Sun workstations, don't worry if you can't buy an original family tree poster for $75. Focus, focus, focus and have fun, fun, fun.

Forecast

There is definitely a future for the hobby of collecting computers. It includes fun, fulfillment, organization, profit, and more fun. Perhaps you don't like what you're hearing. Those words, organization and profit, might upset you, but you must face the inevitable. The world of collecting computers is changing, but hey, change is what computers are all about. If you can't see how such a relatively new, informal, loosely-knit community, as we currently see ourselves, can ever turn into the fine tuned machine that stamp and car collecting has become, then we should examine the past and see what we can learn from it.

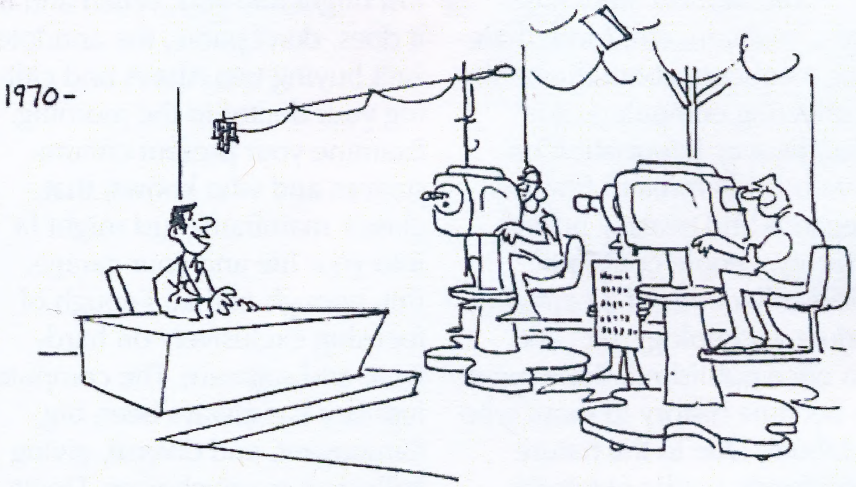
Let's take an older, similar technology that is collected and compare it to computers. We'll see what is different and what is similar about the technologies and see how, if at all, the technology affected collectors. The examination might tell us what we should expect to see in our hobby. The car is the standard we'll use in this comparison. Hopefully this exercise will convince you that what has happened to the hobby of collecting cars can happen to computers.

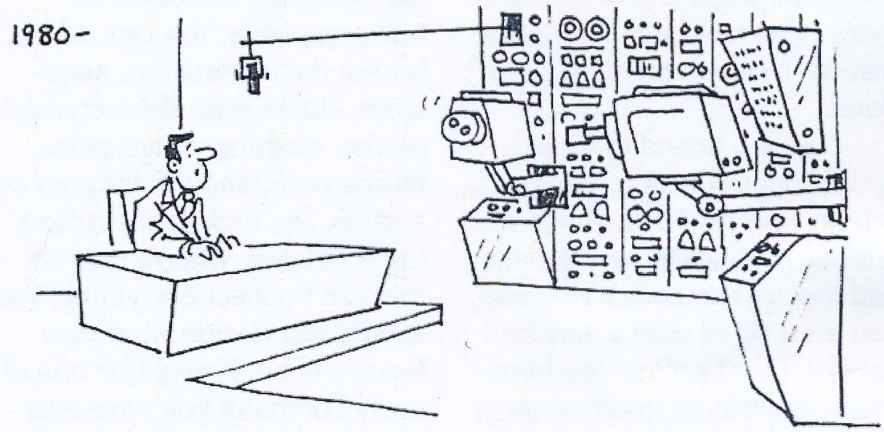
	Car	*Computer*
Popularity of the technology:	High	High
Relative age of the technology:	Young	Young
Relative size of the technology:	Big	Big
Technology lifespan:	Brief	Brief
Technology rate of change:	High	High
Level of expertise to maintain:	High	High

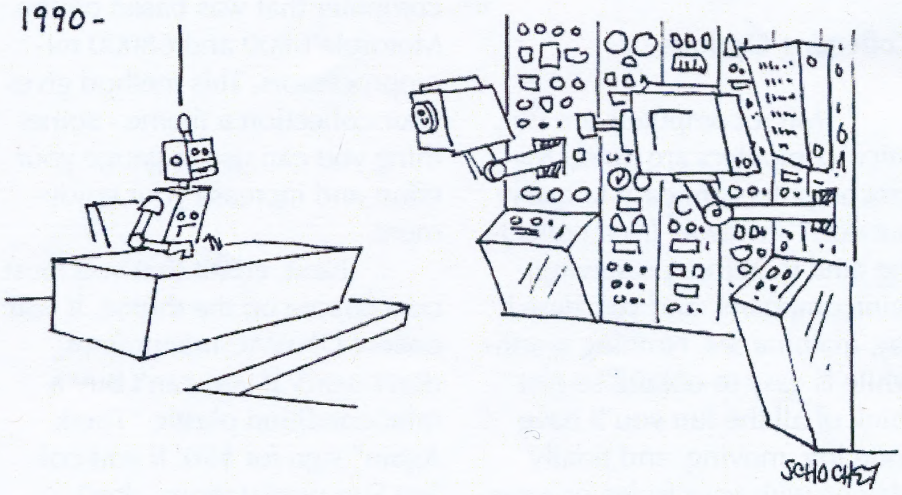
As you can see, computers and cars have much in common. For instance, both are such new technologies that most people consider them too recent to collect. Both are big and typically not easily moved and stored. Both experience frequent upgrades which potentially increase their collectibility, but on the other hand, their disposal can be easily justified. Both are popular, utilitarian technologies. Both are also complex and require a level of expertise to maintain. The similarities inherent in the technologies will be reflected in how their respective collecting hobbies evolve.

If you know how active and successful collecting cars has become, then it follows that our hobby will grow, mature, become less esoteric and more mainstream. It will become attractive to a generation with little or no prior contact with the computers and computer collectibles they collect. It might become an industry in itself.

Freaked-out Freddy Flip Chip







The Alto Computer

The Mother of Invention?

By UNKNOWN*

The Alto was produced from 1973 to 1979. There were two models (Alto I and II) developed with II superceding I.

The Alto Computer can be considered the source of many of today's GUI concepts and systems. But the Alto was designed as a research tool, and as such had many "faces" depending upon what a researcher needed. The Alto had many different environments, some of which were very antiquated. Only the Smalltalk development environment sported a fully integrated GUI. The normal Alto operating system (called the Alto OS) was command line oriented. From this command line you could run programs like WYSIWYG (What-You-See-Is-What-You-Get) word processors or bitmap drawing programs.

Design

The Alto was designed in two months (from 11/72–12/72) and two wirewrapped prototypes were created in four months (from 1/73–4/73). Three people worked on the design and implementation of those units.

Implementation

The Alto was produced from 1973 to 1979. There were two models (the Alto I and II) developed with the model II superceding I. RAM size started at 64K words (an Alto word was 16 bits thereby making the 64K model really contain 128K bytes). RAM size for the later Altos were 256K words (512K bytes). The Alto's digital hardware used MSI (medium scale integration) chips and was rather large compared to todays micros. The processor was custom-built by Xerox and occupied five boards with around 70 chips each (this makes the CPU have around 350 chips!) RAM consisted of around 312 chips. The I/O Controllers resided on three boards with 60 chips each (180 chips total). The Alto mouse had three buttons (mainly for use by the Smalltalk development environment).

Software

Word processing was a major Alto activity and Xerox produced two word processing programs, Bravo (later improved and called BravoX) and Gypsy. Bravo was the first WYSIWYG program, but was difficult to use due to it being modal. Gypsy was less modal and therefore easier to use, but was not as powerful as Bravo. Each programming language for the Alto also sported its own simple word processor for source code files. Alto also included a collection of three drawing programs, Markup (bitmap editor like the Apple Macintosh's MacPaint), Draw (splines like the Macintosh's MacDraw), and SIL (technical drafting using only horizontal

and vertical lines with characters and special symbols).

Programming Languages

BCPL (predecessor to C), Mesa (Pascal-like but with module handling), Smalltalk (fully integrated, the highlight of the Alto GUI), LISP (boring to me), and Cedar (very sophisticated, integrated).

The Daughter?
Apple Lisa

Origins

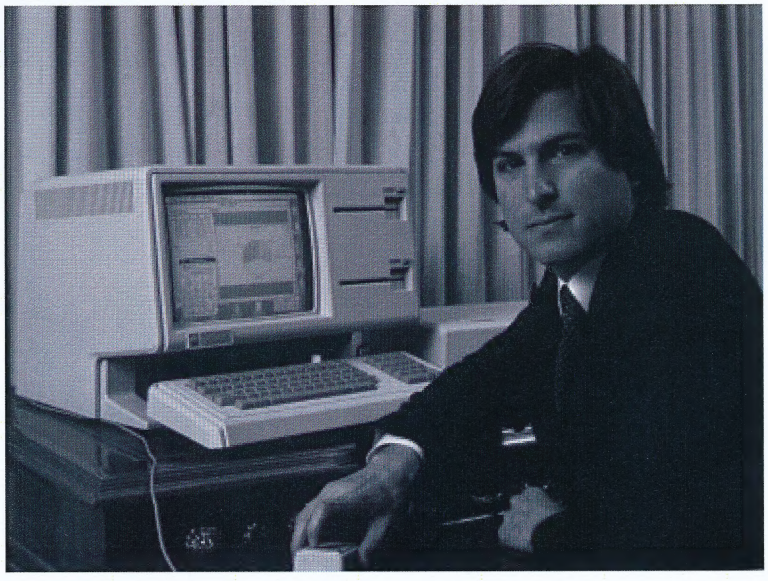
Apple began work on a computer called Lisa (named after Steve Jobs' illegitimate daughter) in mid-1978. This system was text-based, had a green monitor and dark case, and was to be powered by a custom CPU built by Apple (this was a fast bit-slice CPU that executed Pascal P-Code). In October 1979, Apple dumped the bit-slice CPU for the Motorola 68000 since it was cheaper. At the end of 1979, several Apple people visited Xerox PARC, saw the Alto and Smalltalk's GUI, and changed the Lisa to be a GUI machine from then on. As such, the Lisa did not begin life as a GUI system, but rather as a staid text system whose only merit was that it was to be a fast 16-bit system. You could say the Lisa went through three iterations, with the third being the GUI system which Apple sold commercially. Note that Apple implemented Smalltalk-80 on the Lisa around 1980–81 as a R&D environment.

Hardware

The Lisa pixels were rectangular, since this pixel shape produced more readable characters. The Lisa's 68000 CPU ran at 5MHz (compared to the Macintosh's 8MHz), but the Lisa wa somewhat faster than the Macintosh, since the Lisa used DMA and supported distributed internal processing via several microprocessors (the keyboard contained a COPS chip, the Twiggy 5.25 860K disk drives contained a 6502 chip).

Operating system

One can in no way say that the Lisa operating system was not quite as refined as the Macintosh operating system (as *Historically Brewed* once said). The Lisa's low-level OS was very advanced and supported processes, non-



premptive multitasking, and demand-page based virtual memory (a scheme Apple may adopt for Mac OS 9 in the future). The high-level OS (called the Desktop Manager or the Lisa Finder for Mac people) supported inter-application events (Apple now calls these AppleEvents), a document-centered interface via stationary pads (the Mac is application-centered), and non-physical (logical) document names (i.e. a document name could be up to 63 characters long for the user-though the Lisa File System supported physical names with up to 31 characters). Documents could also have the same name in the same folder.

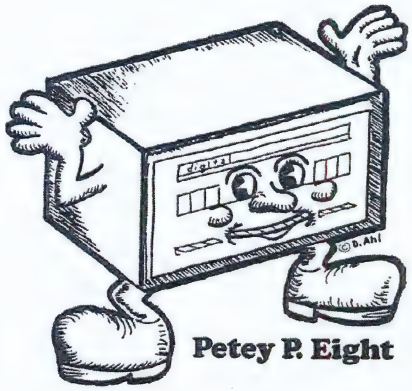
Boot ROM

The 16K ROM contained code that tested the system at startup and booted the operating system. Nothing else was in the ROM (e.g. user interface code). This scheme was adopted for the Lisa (versus the Macintosh scheme of having a lot of code in the ROM) to make the Lisa more versatile from an OS perspective. For example, the ROM first loaded the OS Loader, then the OS Loader loaded the Lisa low-level OS (or MacWorks if you had the MacWorks disk), then this OS loaded the default high-level OS Shell (e.g. the Lisa Office System or the Lisa Workshop or UNIX), then the Shell (which was called the "Desktop Manager" by users) loaded the various Lisa tools (a.k.a. applications).

The Lisa's user interface was based on a set of code modules collectively called the Lisa Desktop Libraries. This library resided in two files on the Lisa hard disk and not in the Lisa boot ROM. This implemented such familiar features as windows, mouse handling, and graphics drawing. This library code was around 500K in size and was mainly written in Pascal. Apple later took parts of this library and recoded them in 68000 assembly language for the Macintosh 64K Toolbox.

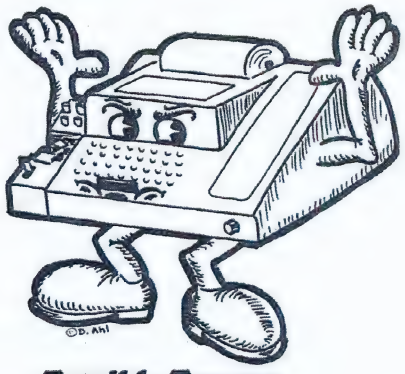
One area of *HB*'s GUI article which I found remiss was the lack of names associated with the development of today's GUI. It seems that many UI designers migrate from one company to another improving their UI strengths at each successive company. Xerox obtained several UI designers from other companies to found Xerox PARC.

Apple hired several Xerox people for the Lisa development (e.g. Larry Tesler - GUI, Tom Malloy - Bravo / LisaWrite). Microsoft hired Charles Simonyi, who directed on the Alto software development and who reimplemented Bravo on the IBM PC. He called it MicroSoft Word.



Petey P. Eight

Devilish Donald Diskpack



Terrible Tommy Teletype

The First Bug

What was it?

By UNKNOWN*

What was the first bug? That is, when did people start referring to the glitches that computers make as "bugs?" In my own case, it happened about two lines into my first computer program, back in 1972. For my initial plunge into computing, I had decided upon:

10 PRINT "HI, I'M THE COMPUTER. WHAT'S YOUR NAME?"
20 INPUT A$
30 PRINT "PLEASED TO MEET YOU ",A$

Not exactly a world-changing, productivity-boosting, paradigm-shaking bit of code, but hey - you have to start somewhere. I punched RUN into the school teletype and prepared to key in my name. However, the computer on the other end of the acoustic coupler (a Hewlett-Packard HP-2000C time-sharing beast) only allowed a single letter for my name. After I typed the "L" it spit out:

PLEASED TO MEET YOU L

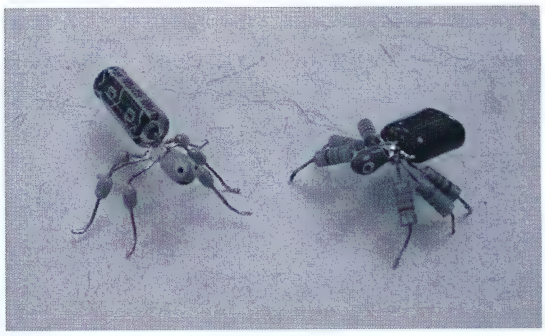
I then understood, almost intuitively, that I had a "bug" in my program. Which led me to change line 20 to read:

20 INPUT A$;B$;C$;D$;E$

This worked great, if you had a five-letter name. The next day, I discovered that in HP-2000 BASIC, strings had to be DIMensioned before they could hold more than a single character. Armed with that knowledge my programs started getting longer. Though I didn't realize it at the time, I was following in a grand tradition. After the first program, comes the first bug.

The FIRST bug then, probably occurred on the first computer program run on the first computer. Curiously, I've never seen an stories on bugs in the ENIAC.

The FIRST bug then, probably occurred on the first computer program, run on the first computer! Curiously, I've never heard of any stories of bugs in the ENIAC. And since Charles Babbage's 19th century Analytical Engine was never built, we'll never know if Ada Lovelace's software would have run. But, the earliest bug we do have documented is truly a great one.

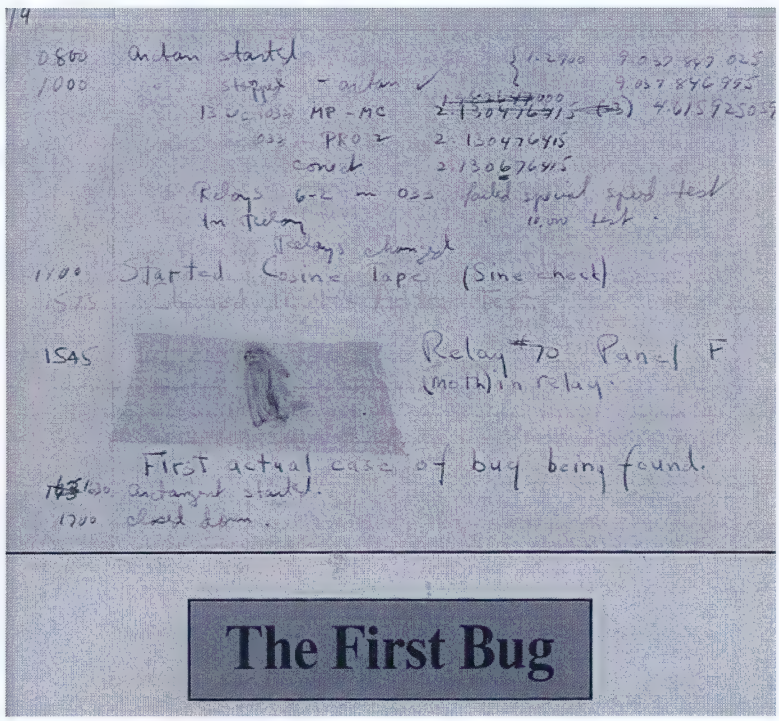


A Harvard professor named Mark Aiken was among those men 50+ years ago who had a vision of machines that could compute. He persuaded Harvard University that they should create such a machine, and he talked IBM into building it - the IBM Automatic Sequence Controlled Calculator (ASCC), or the Harvard Mark I. An inspiring-looking machine, the Mark I stretched 55 feet down one wall with gleaming art-modern chrome and glass accents.

The guts were not as sophisticated as the packaging though. Fearing that elec-

tronics (remember, this was the tube era) were unreliable, IBM built the calculating machine from thousands of electromechanical relays! Unlike tubes, relays didn't burn out. They did have some drawbacks however. Relays aren't fast. IBM's press materials proudly pointed out that the Mark I could add numbers up to 23 digits long at the rate of three additions / second. It could also multiply two numbers in 6 seconds and divide in 12 seconds. These speed records didn't last long.

Relays also made noise - a lot of noise. The Mark I made a sound described, rather charmingly, as resembling hundreds of knitting needles, as it ran calculations fed to it from giant paper tapes. Relays also ran into other problems, and here's where our first bug occurs. The giant machine would occasionally seize up with errors. Sometimes a relay wouldn't make contact. This glitch was intermittent and hard to track down, until one day the technicians working behind the machine found the culprit - a computer bug. A real bug - a real dead one. A moth had fluttered into the machine and gotten crushed under the contacts of a relay!



The First Bug

The exact details of the story vary, but the outcome does not. The moth was removed, and placed under transparent tape on a page of the Mark I's operating logbook with the notation, "First actual case of bug being found." The logbook exists today in the archives of the U.S. Navy. You can look it up.

It's tempting to claim this as both the first computer bug, and as the origin of the word "bug" in the sense of glitches and problems. Certainly most people wouldn't argue this, but it isn't so - the word "bug" predates the computer.

Here's a mystery for you: I have before me a reference to "bugs" - instantly comprehensible in context - from way back in 1878. The speaker apologized to the press for delays in getting his newest technology out to the public, claiming he still needed several months or perhaps a year "to get the bugs out." He went on to write, "It has been just so in all of my inventions. The first step is an intuition, and comes with a burst, then difficulties arise - this thing gives out and [it is] then that 'Bugs' - as such little faults and difficulties are called - show themselves and months of intense watching, study and labor are requisite before commercial success or failure is certainly reached."

The speaker - sounding remarkably like a 19th-century Bill Gates - was Thomas Edison. The high technology he was wrestling with was the electric light bulb (and thank goodness he didn't call his product "Light '78!").

Which came first, the bug or the computer? Surprisingly, the bug. It's at least as old as Edison. How much older? Good question. One can almost imagine Johannes Gutenburg, struggling with version 1.0 of his printing press, trying to work the bugs out so he could bring printing to the masses.

Pleased to meet you Johannes. We have something in common.

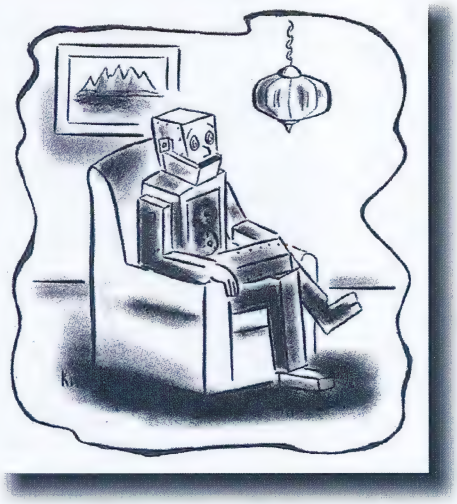
Editor's note: During layout and editing of this article, I discovered that this moth was actually found in the relays of the Mark II in 1947. It is often erroneously attributed to Grace Hopper as well, who wrote about it, but did not find it.

COMPUTIN' IN THE OL' DAYS

"...We'd like to put two bucks on 'Happy Daddy' running in the seventh today..."

"Looks like it might be a nice day tomorrow!"

"A box of CMOS please. He gets terrible migraines when he has to do intricate figuring."



"I compute therefore I am."

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Byte Nostalgia

A Look Back at the Magazine

By Bill Mitchell

BYTE magazine was a microcomputer magazine, influential in the late 1970s and throughout the 1980s because of its wide-ranging editorial coverage. It was not dedicated to a specific platform, but to developments in the entire field.

I happen to have *Byte* issue #1 from September of 1975 in front of me, and thought I'd take a quick nostalgic run through it. It's 96 pages long, and 50,000 issues were pressed.

Wayne Green and Carl Helmers each have a scene-setting article. Wayne described how *Byte* started, and Carl tried to define what "homebrew computing" was and how *Byte* would fit into it.

Hal Chamberlin's article, "Which Microprocessor for You?" begins, "At this time there are three microprocessor chips or chip sets readily available to the hobbyist: the 8008, the 8080, and the IMP-16." It seems to me that the 6800 should have been in that list as well.

James Hogenson reviewed the RGS-008A Microcomputer Kit, an 8008 based machine with 1K of RAM. The Front Panel provided rocker switches for loading bytes into RAM, and the program was started by setting a Restart instruction into the Front Panel DATA switches and pressing an "INT" switch. The kit price was $325, a cassette tape adapter kit was $100, and $43.75 for a TTL parallel interface (the only peripheral interfaces available). Those are 1975 dollars folks. The article concludes, "... The 008a is one of the most economical systems on the market, ..."

Carl Mikkelsen's article on Recycling used ICs described how to remove ICs from surplus boards using a propane torch and vise grips for reuse as project components.

No electronics hobbyist magazine of the period would have been complete without an article by Don Lancaster. Don's article is titled "Serial Interface." It describes synchronous and asynchronous serial data, presents circuitry for serial interfaces and describes and presents circuitry for 20ma, 60ma, RS-232, RS-422, and GPIB interfaces. It also describes and presents circuitry for a 300 baud cassette interface, discusses radio data links and presents circuitry for a RTTY receiver. Lastly, presenting and describing circuitry for a Bell 103 300 baud modem interface, and discussing DTMF signaling. At 16 pages, it's a typical Don Lancaster piece which leaves you with eyes glazed over, planning soldering iron time and thinking about parts sourcing.

There's a Clubs section which introduces several microcomputer clubs around

the county. I was going to Chicago Area Computer Hobbyist Exchange (CACHE) meetings around this time, but we didn't get into this section. Oh well (moment of silence here in memory of Ward Christiansen).

Chris Ryland has a short article on "How to Write for *Byte*," and seeking authors (most of the articles in the initial issue are by members of the *Byte* editorial staff).

Dan Fylstra has a nine page article titled "Write your own Assembler." Carl Helmers has a hardware oriented article titled "Deciphering Mystery Keyboards," an article on Charles Conway's Game of LIFE (he credits Conway, and points readers to Martin Gardner's column in *Scientific American* (now sadly defunct), and a book review of the best book ever written on the craft of programming -- *Elements of Programming Style* by Kernighan and Plauger.

There's even a Letters to the Editor section -- pretty neat for the initial issue of a new magazine.

Full Basement

An interview with & by Brian Mahoney, computer collector

What's all that stuff in your basement?
By that I guessed my visitor meant the stacks of computers, disks, magazines and cords in two of my basement rooms. You see, besides poverty, the only thing that I am on the cutting edge of is computer collecting. "Its my hobby," I explained. "Wanna play 'Hunt the Wumpus' ?" I asked.

Where did you get all this?
For the last couple of years, I have scrounged garage sales, flea markets, want ads and thrift stores for anything and everything to do with old, antique computers. Antique is a relative term here. For me, it means something that is totally useless in terms of practical computing, but something that at one time was very serviceable and, frequently, very expensive. My particular interest is home computing. Someday I would love to open a home computing museum where visitors could actually play a game of "Hunt the Wumpus" or Zaxxon or Missile Command. For the time being however, you will have to visit my basement.

What types of computers do you have?
Everything from Commodore Vic-20's, C64's and C128's, to a Hyperion portable, a couple of Franklin Aces and this thing called a Decider. The Decider is an Apple II clone but this is far nicer in appearance than the run of the mill Apple. It has a wooden case and a painted metal cover, but only a black and white video output. That's OK as, I don't have the special RGB interface anyway. Besides these computers, I have many others in what used to be a guest bedroom, Apples, Tandys and so on. Oh yeah, there's another stack in the washroom cupboard, a few more IBM clones set up on the family room corner table . . . uh, and some monochrome monitors and XT shells on a shelf between the rafters.

Is that it?
Not really. To support all of this hardware, I also have a large collection of books, manuals and schematics. The books are from the days when you couldn't go down to the software store to pick up the latest computer game. You had to sit and write your own or laboriously copy out someone else's program. There are also piles of magazines from the early eighties, listing almost all of the equipment I own at its original price. I should say that the magazines also give you some kind of idea of the growing interest in home computing, the excitement and the early versions of some of the stuff we have today. Of course, the mags have programs in them, too.

Anything else?
Well, there's the software. Boxes and boxes of 5 1/4 inch diskettes, game cartridges, cassette tapes with programs on them, and a few low density diskettes. While this material is mostly Apple based, a good deal of it is Commodore based, lots of Vic 20 and 64 items and some for the 128 and something called Windows Version 1.

So that's it right?
Not exactly. There's also a large pile of game consoles and modules, mostly ColecoVision, Nintendo and Atari. These are from garage sales mostly. I've got this neat steering wheel module with a gas pedal attachment. Wanna play "The Dukes of Hazzard"?

Are they considered computers?
Well, you could ask yourself the same thing about the computers we are using now. In twenty years we might be saying, "Hell, those weren't computers. These are real computers." At the time, these video game modules were revolutionary. They were interactive before anyone knew what interactive meant. And they are still alot of fun. The games were generally non-violent and loads of fun. I have one titled Impossible Mission which plays on the Commodore 64, complete with great sound and wild visuals. It is difficult to play and has many levels and, this is the best part, when the guy misses his footing and falls into the pit there's this incredible scream. Its the same scream they use now in Duke Nukem 3D. Duke Nukem has many bits of trivia in it referring to retro-computing and the scream is a reference all the way back to the Commodore 64.

What's the point really? Isn't this just someone else's junk?
Maybe, but have you priced an old Victrola lately? A brightly painted metal lunch box? A 1957 Chevy Belair? I myself had a Robin Hood metal lunch box and Thermos about 35 years ago. Conservatively, it would be worth sixty-five bucks now. Who knows what the Decider will be worth in another twenty years? Or the Franklin Aces? Someone on the Web thinks the Franklins might be worth a hundred bucks now. That's ninety more than I paid, one eighty for the pair. The trick is to find the right buyer, so you want to keep all of this and sell it later. Not really though, If I have several of the same model I might consider it, but the point, and, you'll have to sit down for this one . . . the point is that this stuff is all going into landfills and if someone doesn't grab a bit of it here and there, there won't be anything to show my kids or your kids! Automobiles progressed from horseless carriages to Saturns over many decades. Computers, home computers that is, haven't even been around for twenty years, yet look how far we've come. The average home computer now has the speed and capacity of the supercomputers from less than twenty years ago.

Have you been computing for a long time?
Just the opposite. I have only been in this or any form of computing for a few years. You see, the first computer I bought, the Commodore 128, was at a garage sale. The main reason for picking it up was that it had a color monitor. I knew I could use that monitor for showing videos to the kids by hooking it up to a VCR. The computer interest came later when I decided to put it all together for word processing. Then I discovered the games. The rest, as they say, is history.

Where does it go from here?
Well, hopefully more people will get on the bandwagon. The beauty of collecting is that the items that are collected become treasures, and treasures are kept for a very long time. The end result is that these relics, these pieces of metal and plastic will now be around for quite some time. There are some concerns about EPROMS gradually deteriorating and other memory problems, but I figure sooner or later there will be a solution for that.

Kind of like watching paint dry?
Some people have that point of view, but the beauty of collecting is that there is always something for everyone. In the world of computer collecting, you would be surprised at the diverse items that people find attractive. One fellow has a group of office computers in his apartment. Another has large business units in a warehouse. Still others collect software, magazines, advertising and all the various and sundry bits that go with computers. Anyone can get started, probably with what they have. If you have an old unit in your home now, try to locate user groups who specialize in that particular model. Atari and Commodore user groups are worldwide. Even the Internet, actually the Web, is full of retro computing sites, some having emulation programs to make the latest computers run like the relics that I have in the basement.

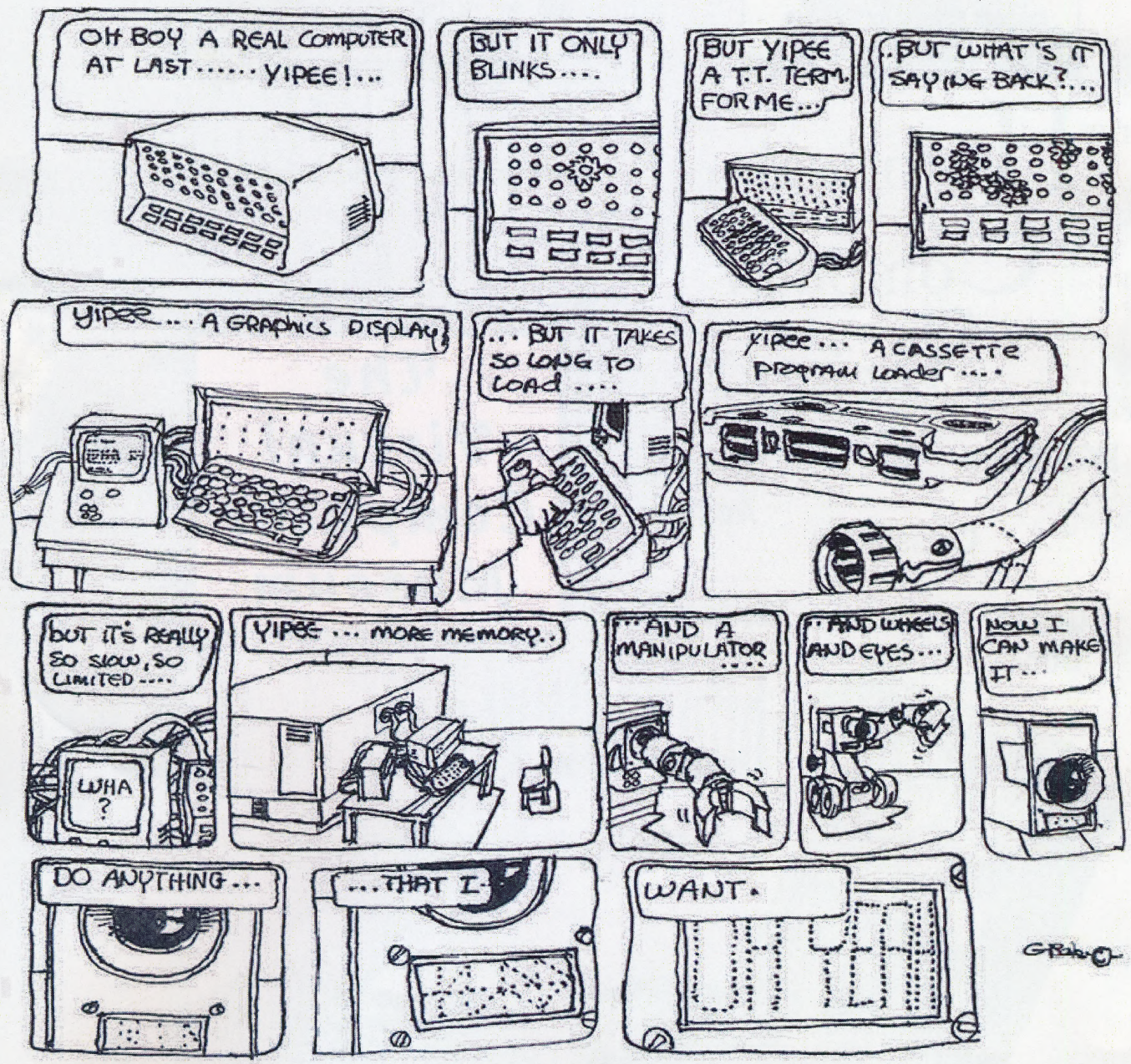
You're kidding, right?
Not at all. I have a program right now on my IBM that will allow me to run Apple II programs. The starting screen is exactly like the various Apple II's I have downstairs. But I would rather boot up one of mine and wait for the disk drive to grind its way along. That gives me more of a sense of true history.

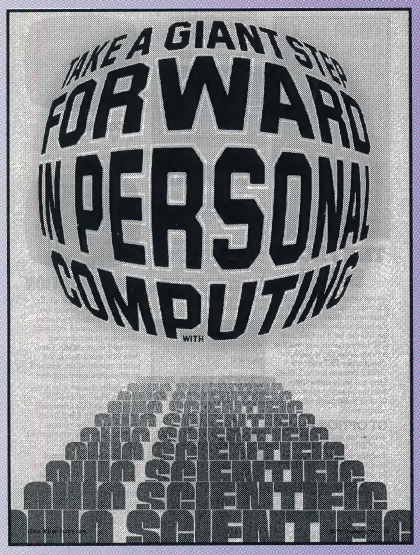
Well, I guess I'm somewhat educated now. Let me try that Whump the Humpus thing! It's Hunt the Wumpus. It'll only take me a minute. I think I saw it in one of these boxes.

A HOME COMPUTER

as seen by

GEORGE BEKER





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